Amendments to the Drawings

The attached drawing sheets includes changes to Figs. 2, 4 and 5. These sheets, which include Figs. 2, 4 and 5, replace the original sheets including Figs. 2, 4 and 5. In Fig. 2, a typographical error in blocks 128 and 130 have been corrected. In Fig. 4, a typographical error in the label associated with element 192 has been corrected. In Fig. 5, typographical errors in reference block 212 have been corrected.

Attachment: Replacement Sheets (3)

REMARKS

Applicants respectfully traverse and request reconsideration.

The written description inclusive of the abstract has been amended. The drawings have been amended. Claims 1-4, 6, 8-13, 15-16, and 18-21 have been amended. Applicants respectfully submit that the aforementioned amendments have not added new matter.

Specification Objections

The Office action states that "Applicant is required to amend the disclosure to include the material incorporated by reference, if the material is relied upon to overcome any objection, rejection, or other requirement imposed by the Office." (Office action, p. 2). Applicants believe that the aforementioned amendments and the remarks have support in the express language found in the originally-filed disclosure. Accordingly, no amendment has been made at this time.

Claim Objections

Claims 1, 10 and 19 stand objected to because they recite the word "for" in the body of the claim, which allegedly "indicates intended use and as such does not carry any patentable weight." *Id.* According to the Office action, the original claims "appear as a series of non-functional descriptive material/data without any functional relation with each other." (Office action, pp. 2-3). The Office action suggests that the body of the claim be "changed to 'superword register value number.'" (Office action, p. 3).

Applicants disagree. The term "for" does not appear in the body of any of the claims. Instead, the term appears in the preamble of each of the claims. For this reason alone, the objection is improper and should be withdrawn. Moreover, Applicants note that the use of the term "for" in the preambles of claims 1 and 19 are with respect to method claims. Applicants remind the Examiner that method claims and limitations in the bodies thereof may contain

statements of intended use and that such statements may, in fact, carry patentable weight. MPEP § 2144. Further, Applicants submit that the objection does not cite any portion of the MPEP that allegedly prohibits an applicant from using the term "for" in the preamble of a claim. Applicants further note that the only section of the MPEP that appears to address the use of the term "for" in a claim preamble is MPEP 2111.02(I) which appears to indicate that the use of the term in a preamble may affect whether the preamble itself acts as a claim limitation. Applicants note, however, that whether the preamble is a limitation of a claim does not bare on the alleged claim deficiency identified in the Office action, i.e., that the claim is merely allegedly "non-functional descriptive material/data without any functional relation with each other."

For these reasons, Applicants respectfully submit that the objection is improper. The claims have not been amended at this time to cure the alleged deficiency. If the objection is maintained, Applicants request that the Office action contain an accurate citation to the MPEP that supports the position currently advanced in the Office action.

Claim Rejections

Claims 1-21 stand rejected under 35 U.S.C. § 101 because the claims are directed to non-statutory subject matter.

As to claims 1, 10 and 19, the Office action states that "the claim raises a question as to whether the claim is directed to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical application producing a concrete, useful, and tangible result to form a basis of statutory subject matter under 35 U.S.C. 101." (Office action, pp. 3-4). The Office action further notes that claims 1 and 10 allegedly do not carry any patentable weight for the reasons identified in the claim objections. Applicants respectfully disagree.

Applicants respectfully submit that the pending claims constitute proper patentable subject matter under 35 U.S.C. § 101 as recognized by the *Interim Guidelines For Examination of Patent Applications for Patent Subject Matter Eligibility* (the "Guidelines") as set forth in MPEP § 2106.

The Guidelines state that a "claimed invention is directed to a practical application of a 35 U.S.C. § 101 judicial exception when it: (A) 'transforms' an article or physical object to a different state or thing; or (B) otherwise produces a useful, concrete and tangible result ...." MPEP § 2106(IV)(C)(2). In explaining what it means to have a tangible result, the Guidelines require a claim to set forth a practical application of a judicial exception to produce a real-world result. MPEP § 2106(IV)(C)(2)(2)(b). The opposite of tangible is abstract. *Id.*

Annex II of the Guidelines refer to the Federal Circuit opinions in *State Street Bank & Trust Co. v. Signature Financial Group*, 149 F.3d 1368 (Fed. Cir. 1998) and *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999) as examples of inventions containing a useful, concrete and tangible result. In *State Street*, the Federal Circuit reviewed a claim directed to a "data processing system for managing a financial services configuration of a portfolio established as a partnership, each partner being one of a plurality of funds, comprising" a variety of structural components including a "fifth means for processing data regarding aggregate year-end income, expenses, and capital gain or less for the portfolio and each of the funds." *State Street*, 149 F.3d at 1371-72. The Federal Circuit held that:

> [T]he transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces 'a useful, concrete and tangible result' – a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades. *Id.* at 1373. (Emphasis added).

Notably, the claim did not use the words "final share price" and the Court did not require that the tangible result, which was the "final share price", be claimed. The mere fact that the *State Street* claim required "processing data" regarding expenses etc. was enough to be considered statutory subject matter. Thus, at least according to the Federal Circuit, a claim need not expressly recite a result that is useful, concrete and tangible in a last step in order to be considered statutory subject matter. The fact that the claims led to or allowed for a recorded, accepted and/or relied upon result was sufficient to establish compliance with 35 U.S.C. § 101.

Put another way, the *State Street* case involved claim language that included means for "processing data" and as such, was held to be statutory when the processing of the data was merely a transformation of data. It was what the data "represented" that the Court held produced a useful concrete and tangible result namely the "final share price". Again, the words "final share price" did not appear in the claim. The processing of data as long as it is processed and the data represents useful information in some form, the claims are directed to patentable subject matter.

In *AT&T Corp.*, the claim language was a method which was a single step method that stated:

> generating a message record for an interchange call between an originating subscriber and a terminating subscriber, and including, in said message record a primary interchange carrier (PIC) indicator having a value which is a function of whether or not the interchange carrier associated with said terminating subscriber is a predetermined one of said interchange carriers. *AT&T Corp*, 172 F.3d at 1354.

The Court held that simply generating a message record was patentable. The transformation of data alone can constitute a practical application of a mathematical algorithm formula or calculation because it produces a useful concrete and tangible result if the data "represents", for example, useful information.

In the instant case, claims 1 and 10 require, among other things, determining if the instruction is redundant by searching a second hash table using the result value number. Both claims require the determination of useful information, e.g., whether an instruction is redundant. This useful information, like the result in *State Street*, is capable of being recorded, accepted and/or relied upon and thus is sufficient to establish compliance with 35 U.S.C. § 101. Accordingly, Claims 1 and 10 are believed to meet the requirements of 35 U.S.C. § 101.

Claim 19 contains similar language as claims 1 and 10 and further requires retrieving an output of the instruction from the second hash table when the result value is found, and writing the operation value number to the second hash table, when the result value is not found. Applicants note that the retrieving of an output of the instruction, is also a useful, concrete and tangible result for the same or similar reasons that the final share price in *State Street* was sufficiently useful, concrete and tangible. Applicants additionally note that the writing of a result value number to the second hash table is, on its face, tangible. If the Examiner disagrees, Applicants respectfully request a detailed explanation as to the reasons employed by the Examiner.

Claims 2-9, 11-18 and 20-21 each depend upon a claim that includes a useful, concrete and tangible result. Accordingly, the aforementioned claims also include at least one useful, concrete and tangible result and are also believed to meet the requirements of 35 U.S.C. § 101.

Claims 2, 3, 6, 11, 12, 15 and 20 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants respectfully submit that although the Office action appears to reject claim 20 under 35 U.S.C. § 112, second paragraph, the Office action provides no details as to why the claim is allegedly indefinite. Applicants, however, note

that claim 20 is similar to claims 6 and 15. Accordingly, it is assumed that the Office action intended to adopt the same rationale in rejecting claim 20 as it used with respect to claims 6 and 15.

Although Applicants disagree with the rationale adopted by the Office action, Applicants have amended claims 2, 3, 6, 11, 12, 15 and 20 to advance prosecution. The added language is believed to constituted inherent claim language. Applicants respectfully submit that the rejections should be withdrawn as the claims no longer appear indefinite.

Claims 1-7, 9-15 and 17-20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,035,124, Ng ("Ng"). Claims 8, 16 and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ng in view of U.S. Patent no. 5,465,374, Dinkjian et al. ("Dinkjian").

Ng appears to be directed to a method of, system for, and computing program product for providing extended global value numbering. (Title). Ng appears to teach that value numbering is performed to identify expressions in code that are candidates for redundancy removal. (Fig. 3, Step 315; Col. 4, ll. 54-60). The value numbering uses a hash table to give each of the right hand side and the left hand side of an expression a value number. (Col. 7, ll. 42-45, 50-51; Fig. 5a, Steps 520-525). The hash table requires a hash key that consists of the op-code and all its expressions. (Col. 7, ll. 51-53). The hash table appears then to be used for storing and retrieving value numbers from a worklist. (Col. 7, ll. 50-51; Col. 8, ll. 6-7). For example, "[e]ach time a new value number is formed, the expression is entered into the hash table." (Col. 8, ll. 7-8). Ng further teaches that value numbers are evaluated and created according to rules. (Col. 8, ll. 8-10). For example, Ng appears to teach that value numbers associated with operands of a PHI function are compared for the purpose of determining a value number of the PHI function

expression. (Col. 8, ll. 10-26). "If value numbers are not equal, then a new value number is formed and assigned if not already assigned." (col. 8, ll. 27-28). In this manner, the hash table is maintained and used.

After the assignment of value numbers, the expressions are marked as redundant or partially redundant. (Fig. 3, Step 320). Ng teaches how to mark these expressions in Columns 10-12. In so doing, however, Ng does not appear to teach the use of a hash table. Instead Ng appears to require the use of PHI functions and the examination of expressions and their already determined value numbers for how expressions can be reached and whether value numbers match. (Col. 10 – Col. 12). Thereafter, Ng appears to teach deleting a redundant expression (Fig. 3, Step 340), processing an invariant expression (Fig. 3, Step 365), processing partially redundant expressions (Fig. 3, Step 375) and performing subsumption and store motion (FIG. 3, Steps 345-350), presumably to optimize the code. Ng appears to also teach that redundancy checks may be performed after such code motion. (Col. 10, ll. 39-40). "Some expressions become redundant only after code is moved to the preheader of a loop. ... This type of redundancy may be determined by a lookup each time any code is moved." (Col. 10, ll. 23-27). However, Ng appears to teach that the same type of redundancy check is performed for moved code as was performed for non-moved code as described above. (Col. 10-12).

Applicants are unable to find in any cited portion of Ng any teaching or suggestion of generating a result value number, for an instruction having an operation code and value numbers of a plurality of sources, based on a previous value number and the operation value number and the determining if the instruction is redundant by searching a second has table using the result value number.

<u>Independent Claims</u>

As to claim 1, Applicants submit that the Office action ignores claim language and that the cited portions of Ng do not appear to teach or suggest each and every claim limitation. For example, Applicants claim, among other things, a method comprising "for an instruction having an operation code and value numbers of a plurality of sources: ... generating a result value number <u>based on a previous value number and the operation value number;</u> and determining if the instruction is redundant <u>by searching a second has table using the result value number.</u>" (Emphasis added). The Office action cites column 8, lines 27-28 and column 10, line 26 of Ng as allegedly teaching each of these limitations. Applicants respectfully disagree.

Column 8, lines 27-28 of Ng allegedly teaches "generating a result value number based on a previous value number and the operation value number." This portion of Ng states that "If value numbers are not equal, then a new value number is formed and assigned if not already assigned." This portion of the Ng is directed to the assignment of value numbers as set forth in Fig. 3, Step 315. As discussed above, this is one of the initial steps of the Ng method and is performed as an initial step to determine the proper value number for a PHI-function expression. Applicants respectfully submit that the cited portion of Ng fails to teach or consider a previous value number as expressly required in the claim. The value numbers compared in the Ng reference do not appear to be either operation value numbers or previous value numbers but instead appear to be operand value numbers. (Col. 8, ll. 12-26). Applicants respectfully submit that operand value numbers are not analogous to the claimed previous value number or operation value number. Because the Office action's rejection ignores claim language, the claim is believed to be in proper condition for allowance.

In any event and solely for the purpose of argument, Applicants respectfully submit that the Office action citation to Ng, at best, appears to teach the retrieval of an operation value number from a first hash table based on the first hash value. In fact, Applicants respectfully submit that this exact citation was used to support the Office action's rejection with respect to this very limitation (i.e., the "retrieving an operation value number" limitation). However, Applicants respectfully submit that the claim limitations (i.e., the "retrieving an operation value number ..." limitation and the "generating a result value number ..." limitation) are not analogous. If they were, Applicants' claim could rest with only one of the limitations. However, this is not the case. Therefore, for at least the reason that these limitations are not analogous, the claim is believed to be allowable.

Column 10, line 26 is cited as allegedly teaching "determining if the instruction is redundant by searching a second hash table using the result value number." Applicants respectfully disagree. The cited portion of Ng is instead directed toward the ability of Ng to determine redundancy using value numbers of expressions and their operands as discussed above and the ability to determine redundancy before and after code is moved. In neither case is a has table searched as required by the claims. Therefore, for at least the reason that Ng does not appear to teach or suggest the generation or use of a result value number (see above), and further because the cited portion of Ng appears to be directed to the use of value numbers associated with expressions and their operands, claim 1 is believed to be allowable for this reason alone.

Claims 10 and 19 have the same or similar limitations as those presented above with respect to claim 1. Therefore, for at least these reasons, Applicants believe claims 10 and 19 are also in condition for allowance.
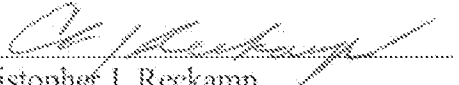
<u>Dependent Claims</u>

Claims 2-9, 11-18 and 20-21 each depend on an allowable base claim and are further believed to add additional novel, nonobvious and patentable subject matter. Therefore, for at least these reasons, the aforementioned claims are also allowable over the cited prior art.

Accordingly, Applicants respectfully submit that the claims are now in condition for allowance and that a timely Notice of Allowance be issued in this case. The Examiner is invited to contact the below-listed attorney if the Examiner believes that a telephone conference will advance the prosecution of this application.

Respectfully submitted,

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